Optimal experimental designs for functional magnetic resonance imaging

Propositions belonging to the thesis

Optimal experimental designs for functional magnetic resonance imaging

1. The results of this thesis suggest block lengths between 10 to 15 seconds while commonly recommended block lengths in fMRI literature are between 14 to 20 seconds (this thesis).

2. Assuming autocorrelated errors instead of uncorrelated errors influences the optimal block length, the optimal number of subjects and block cycles but not the optimal block order or optimal stimulus onset asynchrony (this thesis).

3. The optimal number of subjects for an fMRI experiment can be higher than a commonly employed number of subjects (10-20) (this thesis).

4. For a blocked fMRI experiment, the *A*-optimal number of subjects decreases and the *A*-optimal number of block cycles increases with an increasing ratio of within- to between-subject variance (this thesis).

5. Making a decision in life is similar to using a multi-objective design criterion in optimal design theory as both combine several objectives with different weights.

6. Counterbalancing between different supervisors can be handled by an event-related design. However, this is mostly not optimal.

7. Resting on a local maximum gives a nice view, but the best view is obtained from a global maximum.

8. Nature has more time than humans. That is why evolution never stops, but genetic algorithms have to stop.

9. At the start of a PhD project, the PhD candidate feels like Don Quixote fighting against windmills.

10. When writing a PhD thesis, German thoroughness, Dutch sobriety and British humour make a good combination.

11. "Am Ende zählt, ob einer ist, was er vorgibt zu sein." (Karl Theodor zu Guttenberg, der Ältere, 1971 in dem Buch Fußnoten) – “At the end it counts whether someone is what he pretends to be.” (Karl Theodor zu Guttenberg, Senior, 1971 in a book called Footnotes)

Bärbel Maus, Maastricht, 20 April 2011